OIPE JC167
DEC 2 9 2003
PATENT & TRADEMARK OFFICE

Title: Method and Apparatus for Modeling Injection of a Fluid in a Mold Cavity
[redacted]rs: Friedl et al.
[redacted]No.: 09/404,932
Atty Docket No.: MFL-001
Atty.: William R. Haulbrook, Ph.D.
Express Mail Mailing Label No.: EL 988705086 US
SHEET 1 OF 29

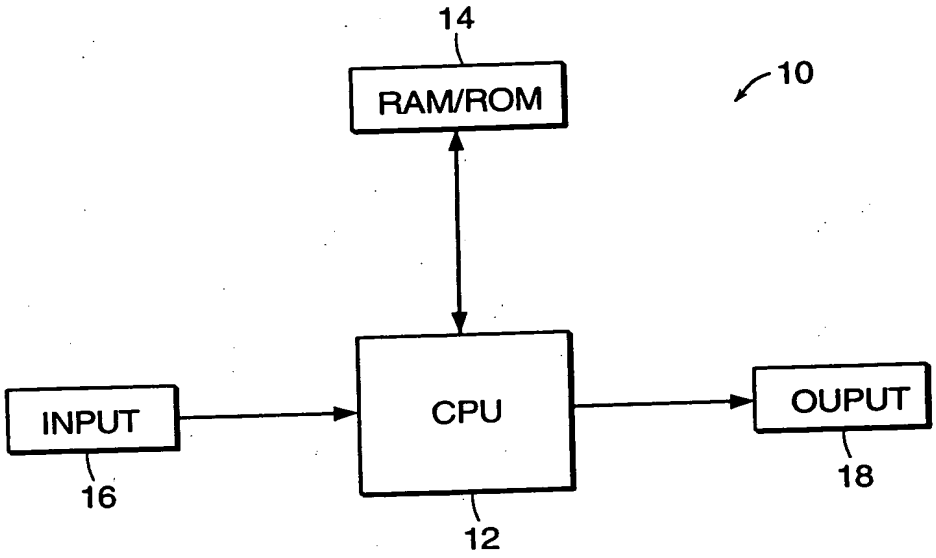

FIG. 1

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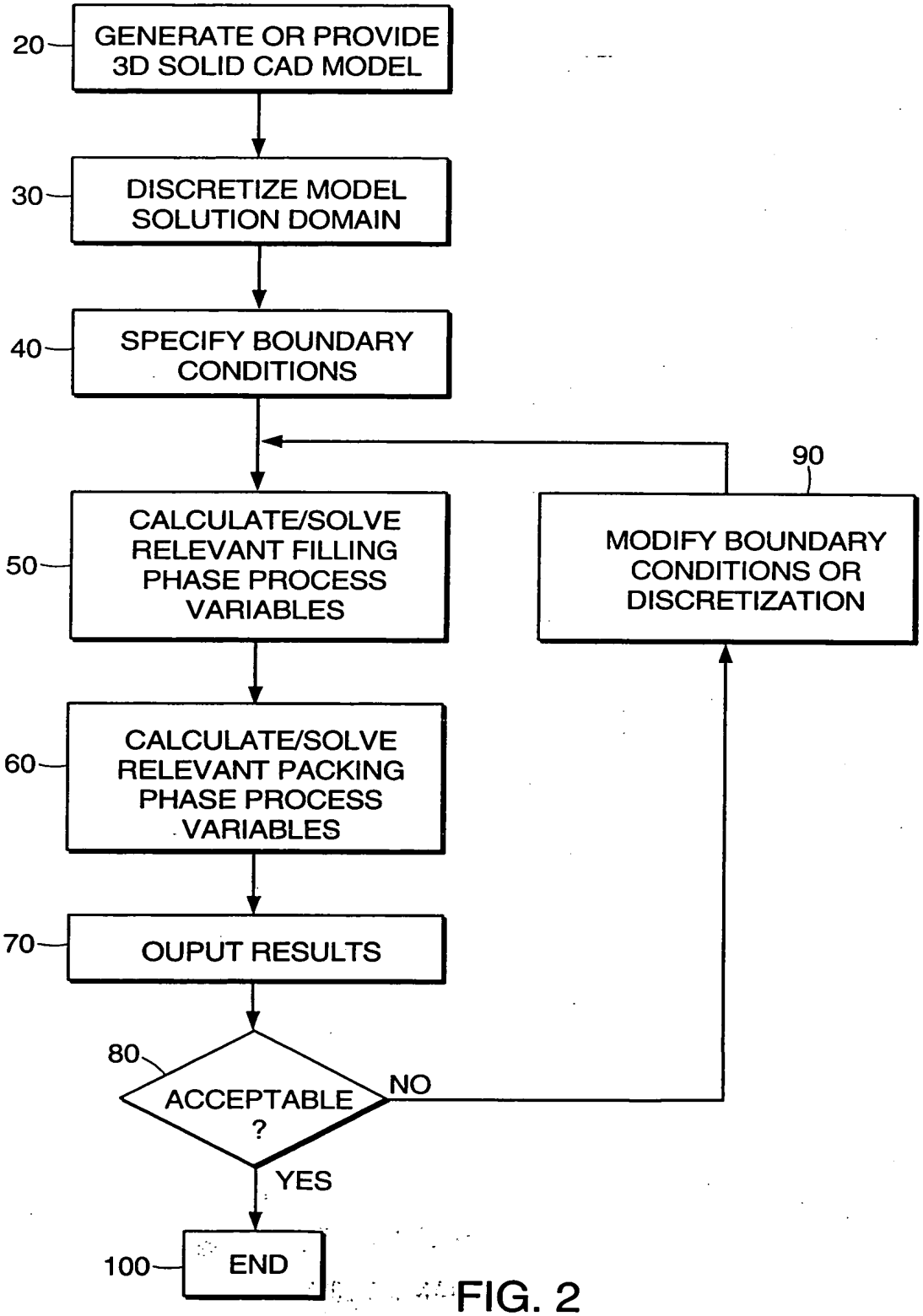

FIG. 2

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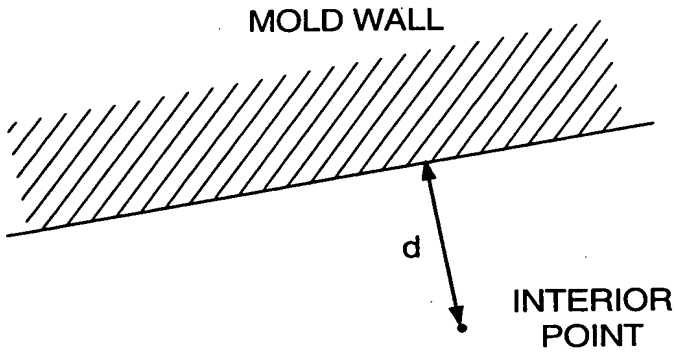

FIG. 3A

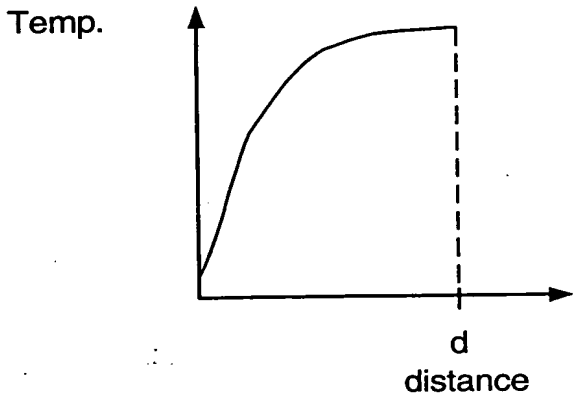

FIG. 3B

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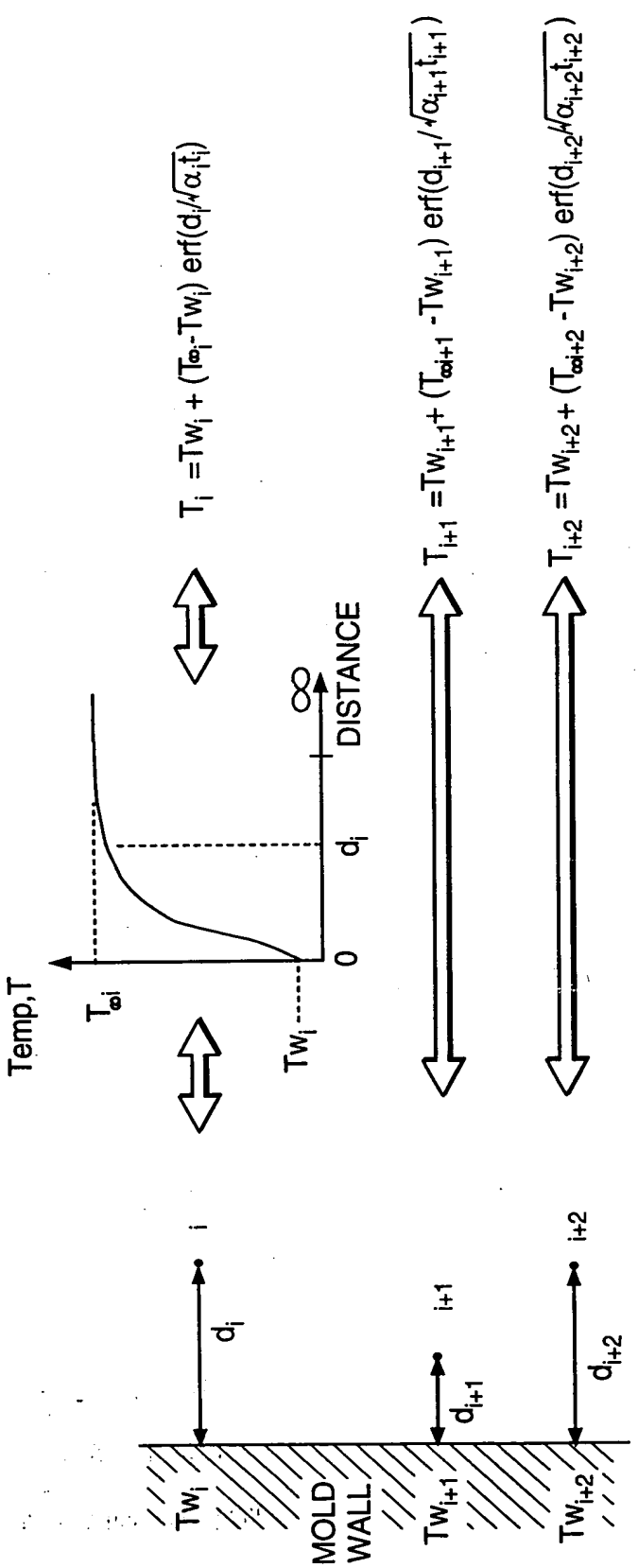

FIG. 4

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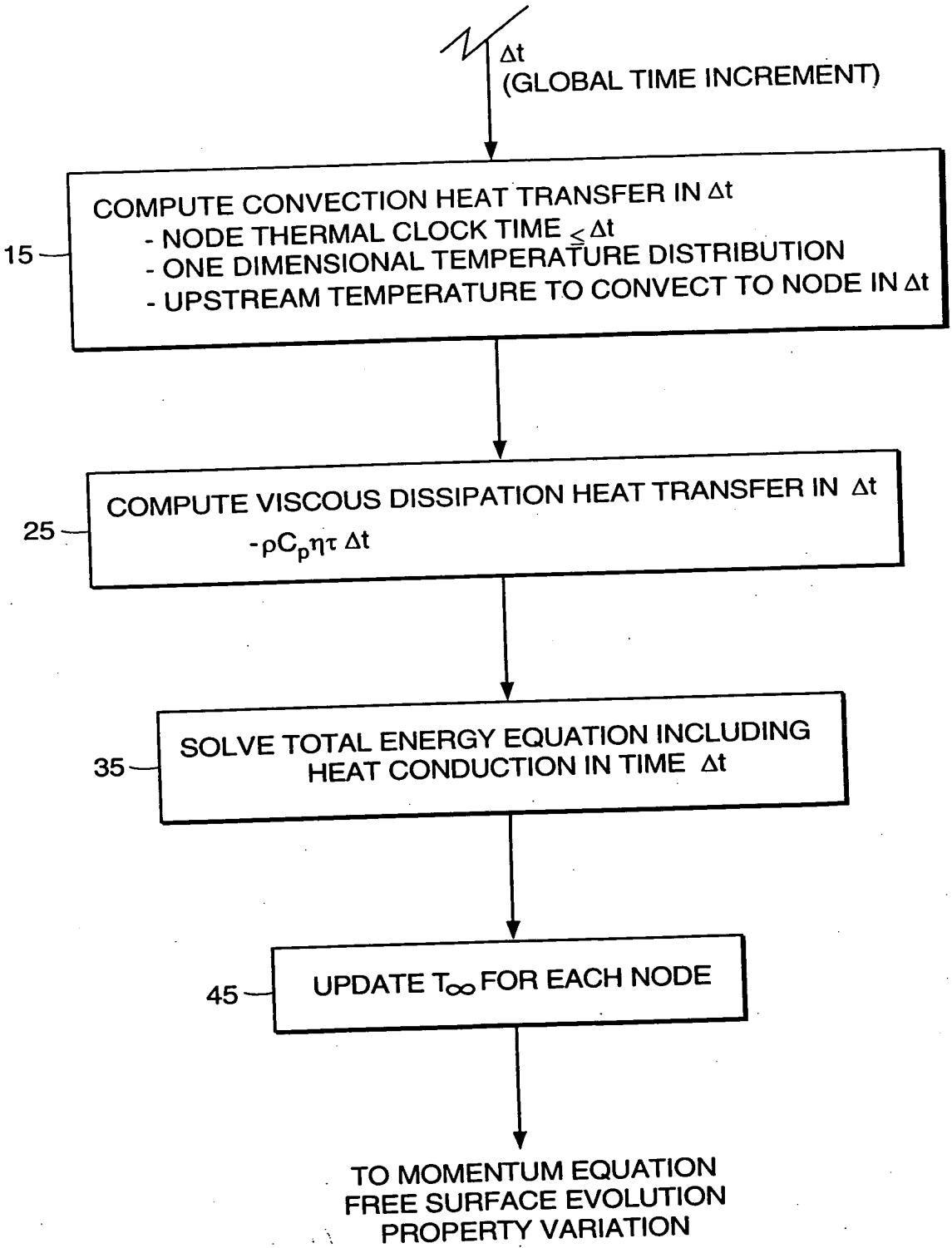

FIG. 5

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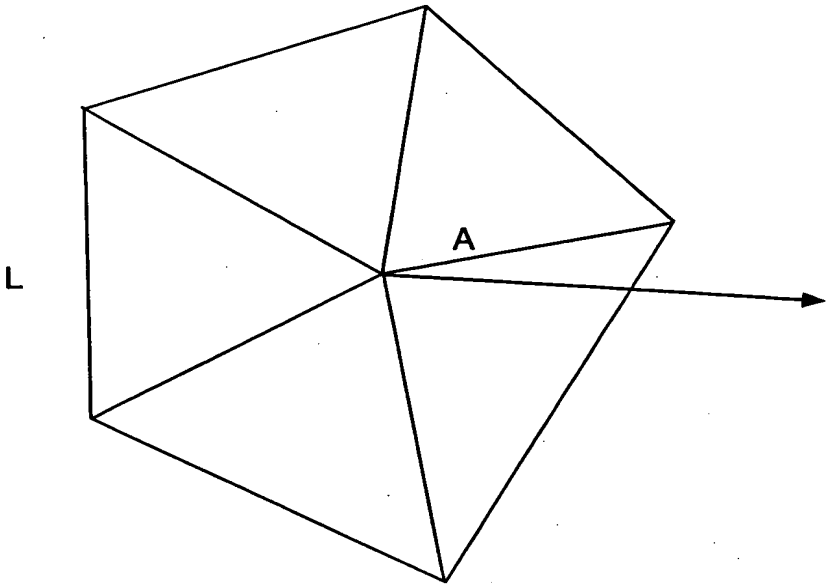

FIG. 6

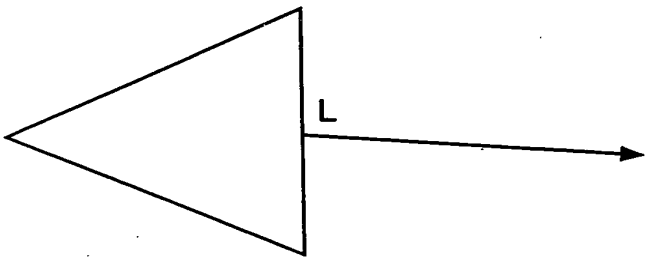

FIG. 7

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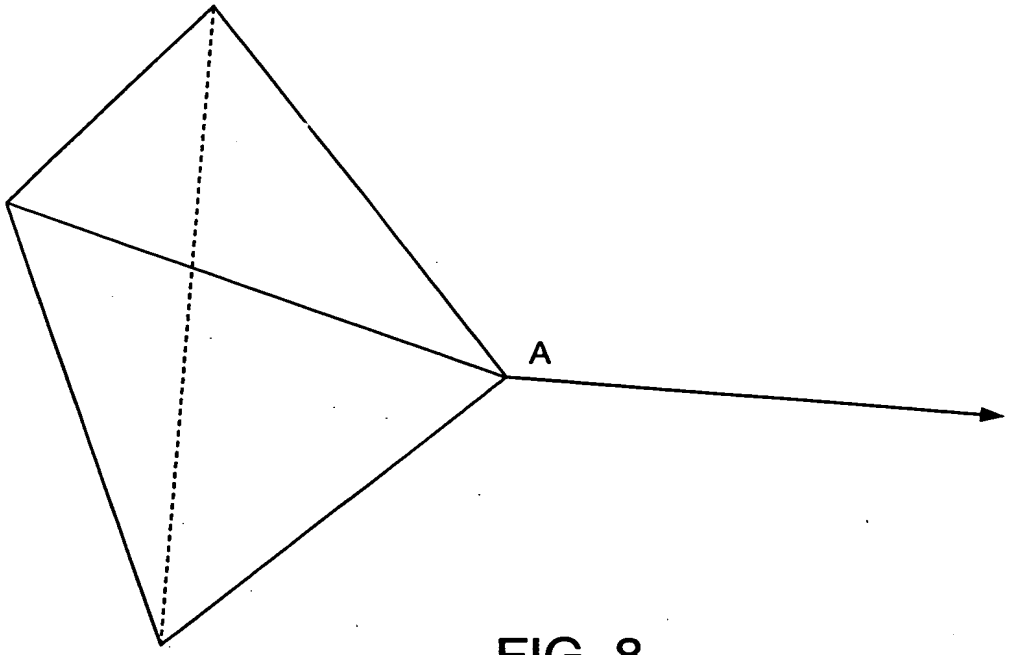

FIG. 8

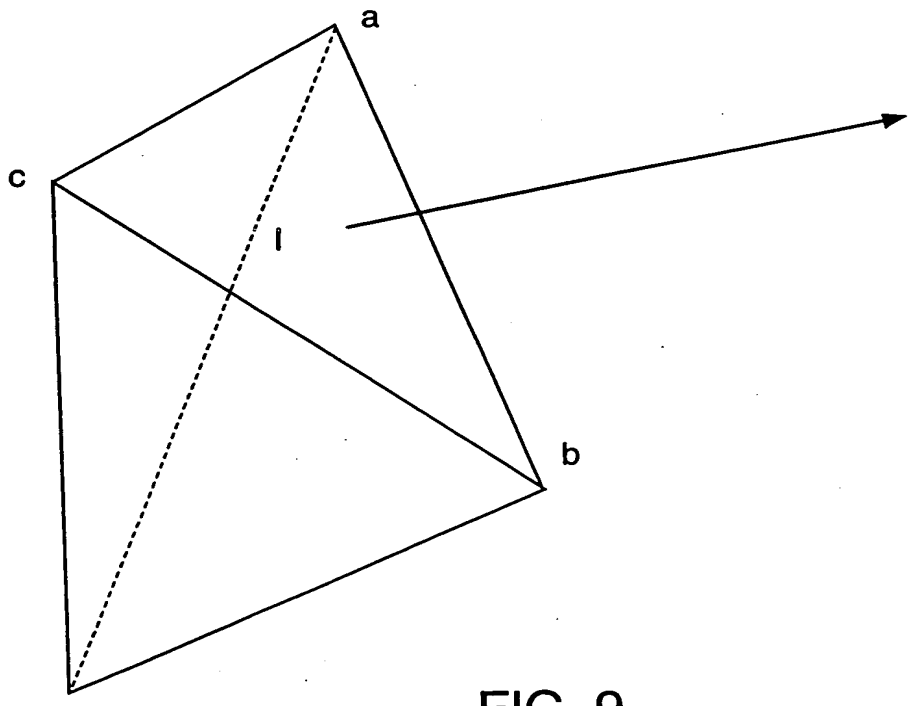

FIG. 9

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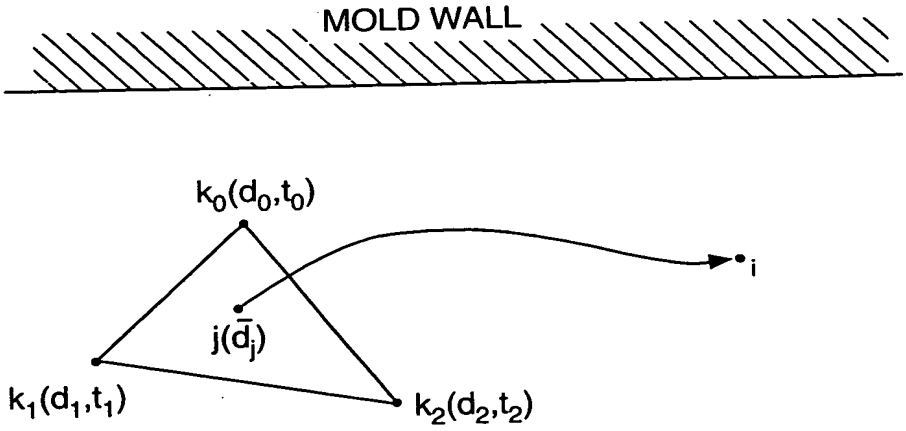

i = TARGET NODE
j = UPSTREAM POINT
k_0,k_1,k_2 = NODES OF ELEMENT CONTAINING THE UPSTREAM POINT
$(d_0,t_0)(d_1,t_1)(d_2,t_2)$ ARE THE DISTANCE TO THE WALL AND NODE THERMAL CLOCK TIMES FOR EACH UPSTREAM NODE RESPECTIVELY
$\bar{d}_j$=INTERPOLATED DISTANCE TO THE WALL OF THE UPSTREAM POINT

FIG. 10A

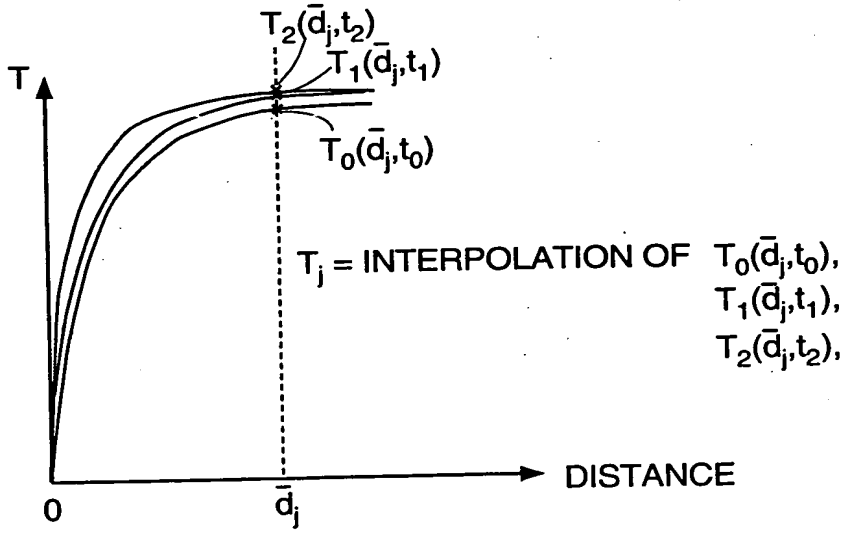

FIG. 10B

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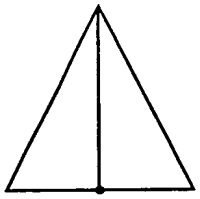
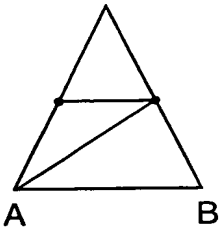
FOR A FACE WITH ONE EDGE REFINED:



FOR A FACE WITH TWO EDGES REFINED:
WHERE A < B



FOR A FACE WITH ALL THREE EDGES REFINED

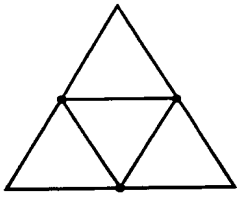


FIG. 11

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TEMPLATE FOR SPLITTING A TET ON:

1 EDGE:

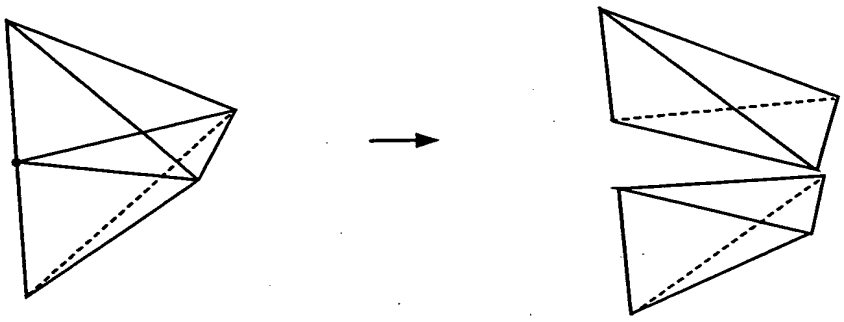

FIG. 12

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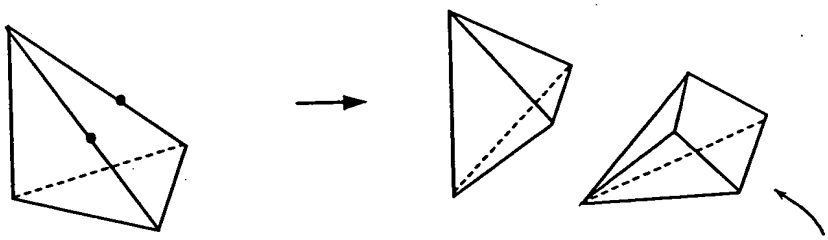
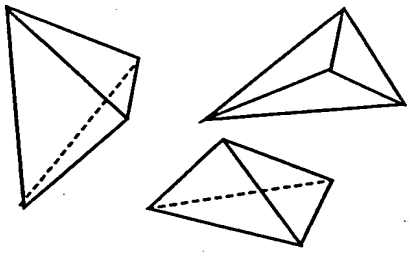
TEMPLATE FOR SPLITTING A TET ON

2 EDGES



NOTE THAT THERE IS A TEMPLATE FOR SPLITTING THE FOUR-SIDED BASE PYRAMID

THIS RESULTS IN:



AS A CLOSED GROUP WITH NEW EDGES MARK

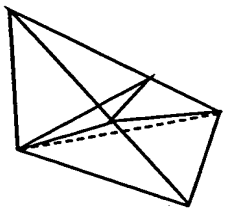


FIG. 13A

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TEMPLATE FOR SPLITTING A "FOUR-SIDED BASE" PYRAMID

INTO TWO TETS

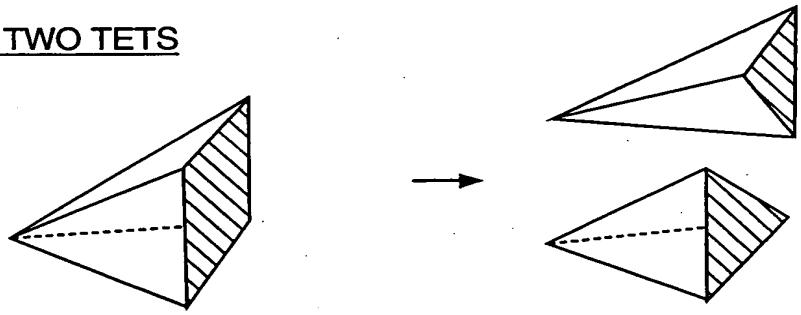

FIG. 13B

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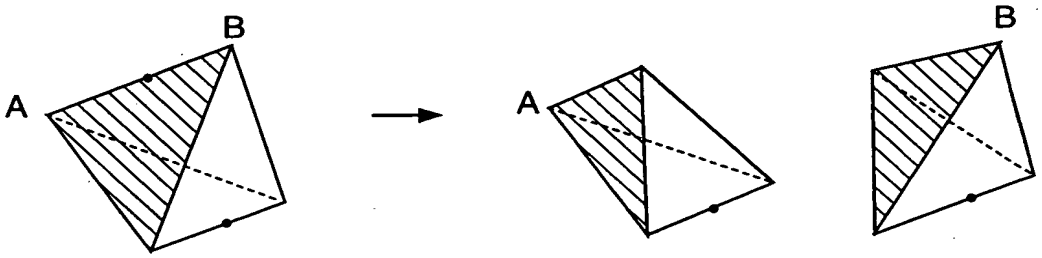
TEMPLATE FOR SPLITTING A TET ON

2 EDGES (OPPOSITE)



THE FINAL COMPACT RESULT WILL BE:

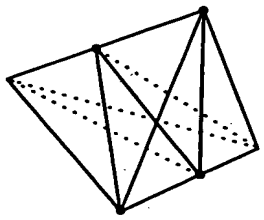


FIG. 13C

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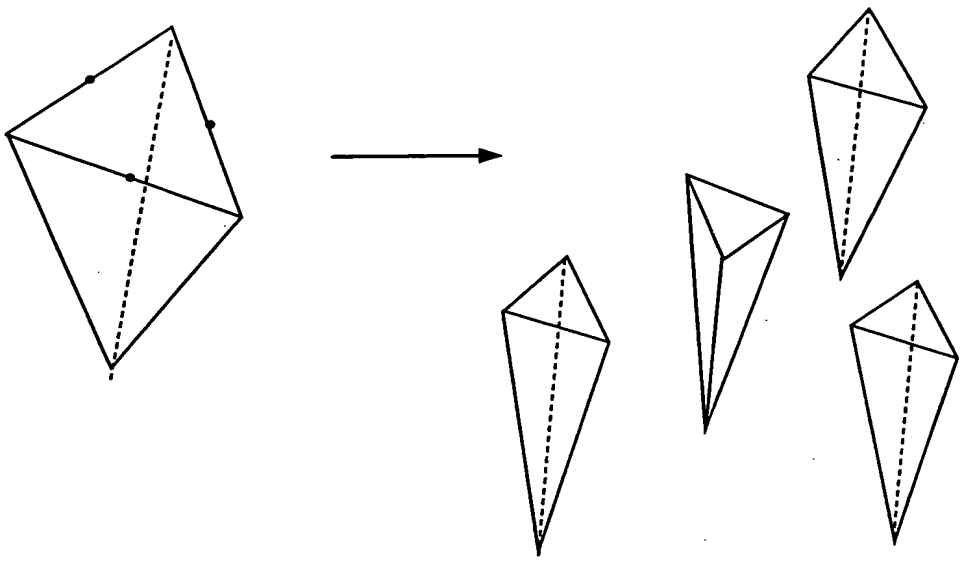
TEMPLATE FOR SPLITTING A TET ON:

3 EDGES (SHARED FACE)



IN CLOSED FORM

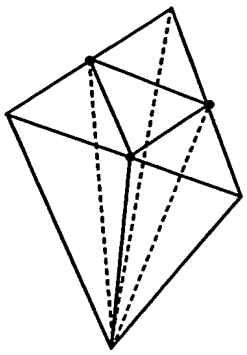


FIG. 14A

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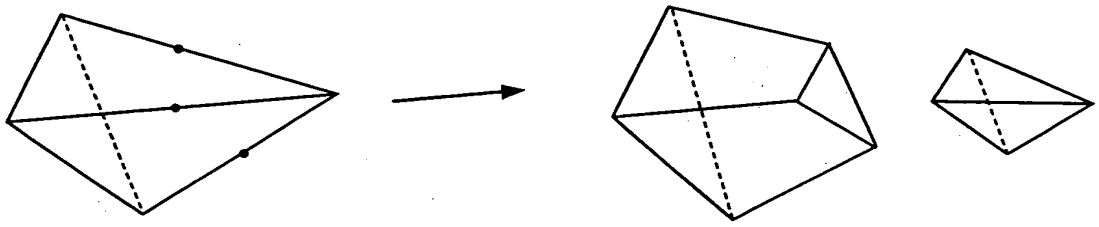
TEMPLATE FOR SPLITTING A TET ON:

3 EDGES (NON-SHARED FACE)



THE FINAL RESULT WILL BE:

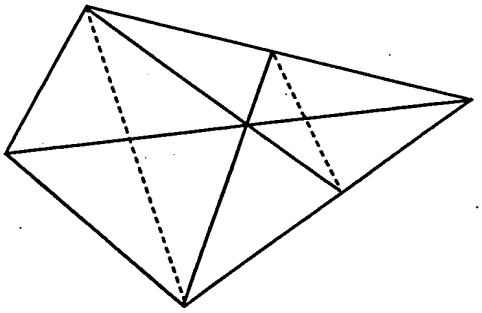


FIG. 14B

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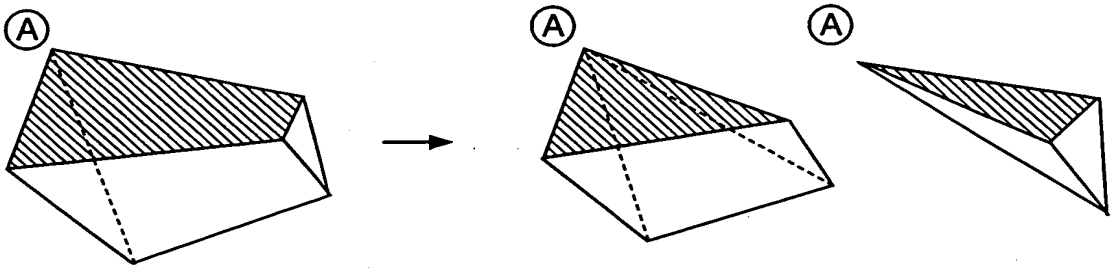
TEMPLATE FOR SPLITTING A TRIANGULAR PRISM



THEREFORE THE FINAL RESULT WOULD BE:

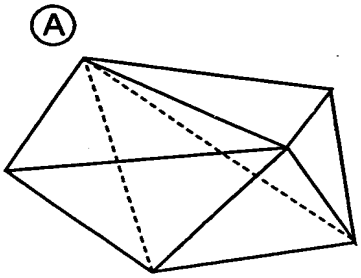


FIG. 14C

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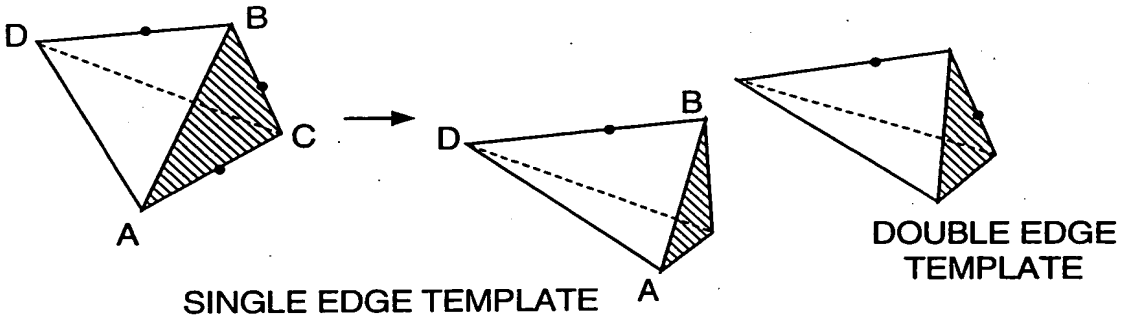
TEMPLATE FOR SPLITTING A TET ON

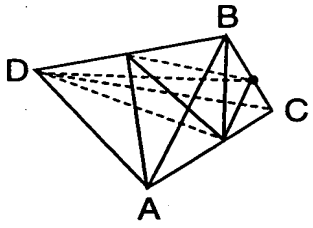
3 EDGES (IN SERIES)

NON FACE, NON SHARED POINT

* IF B OR C ARE THE LOWEST NODE NUMBER (PICTURE FOR B)



FINAL RESULT



ALL FACES ARE EITHER OR

* IF A OR D ARE THE LOWEST NODE MEMBER

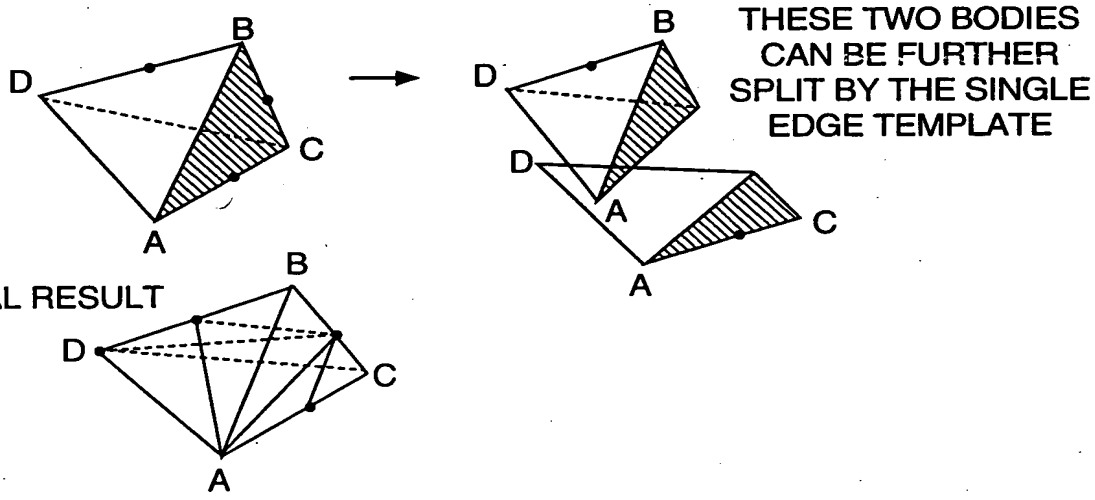


FIG. 14D

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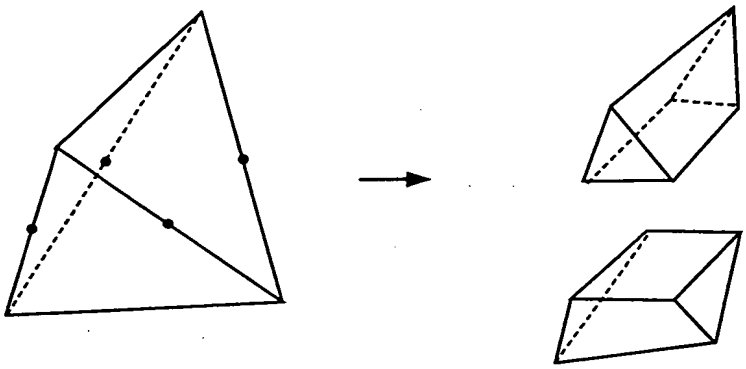
TEMPLATE FOR SPLITTING A TET ON
4 EDGES (OPPOSITE EDGES)



THE EVENTUAL SPLIT BODY IN CLOSED FORM

THE PATTERN ON EACH ORIGINAL TRIANGLE FACE IS:

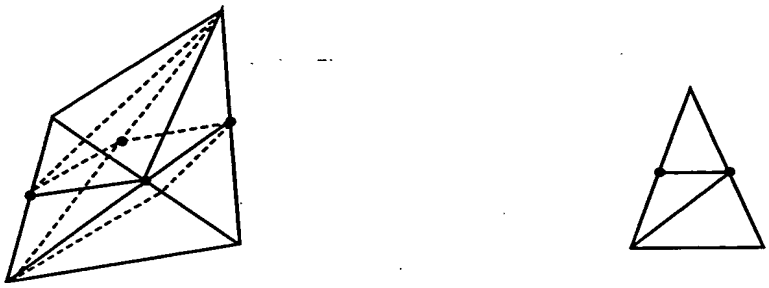


FIG. 15A

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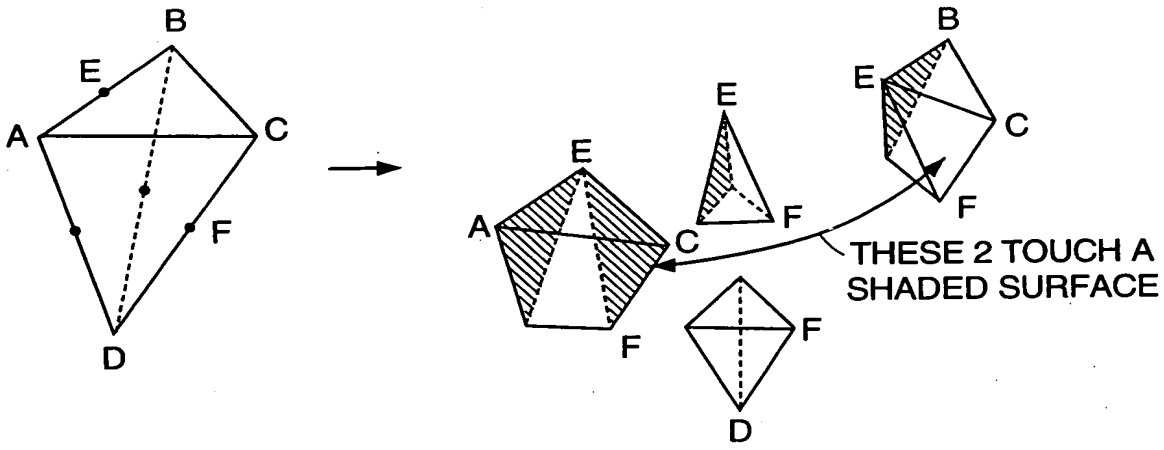
TEMPLATE FOR SPLITTING A TET ON

4 EDGES (ADJACENT EDGES)



THE COMPACTED ORIGINAL TET IS:

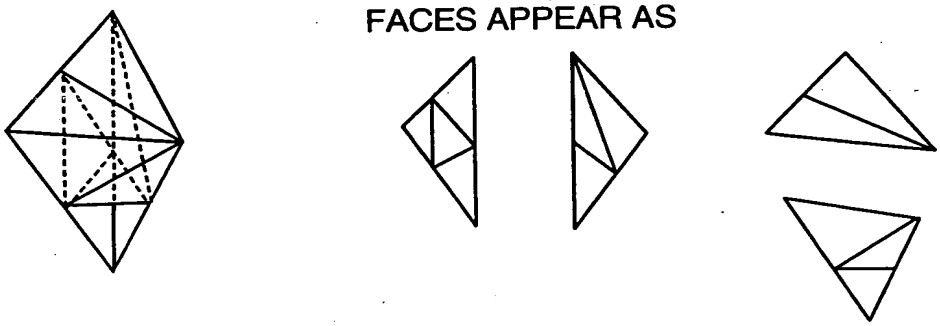


FIG. 15B

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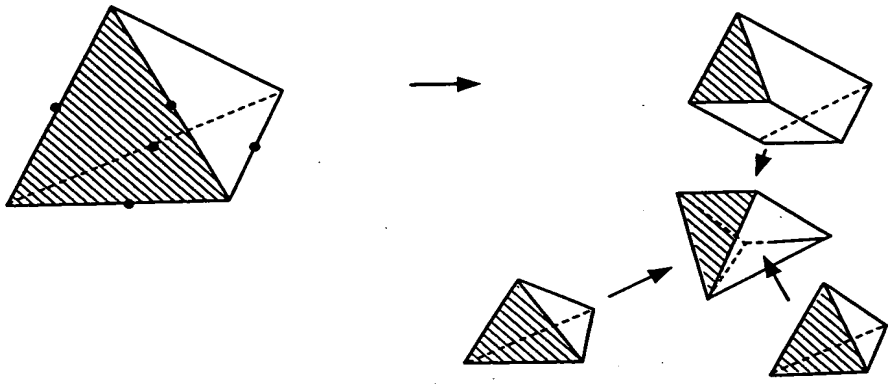
TEMPLATE FOR SPLITTING A TET ON:

5 EDGES



THE FINAL COMPACTED RESULT IS:

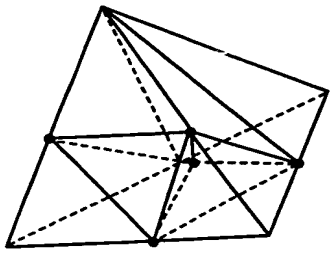


FIG. 16

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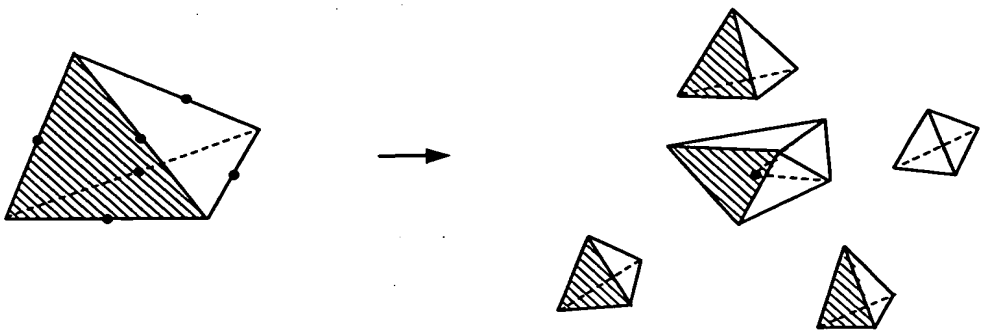
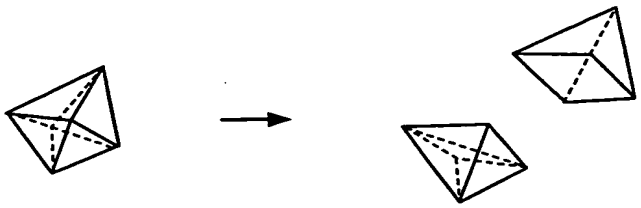
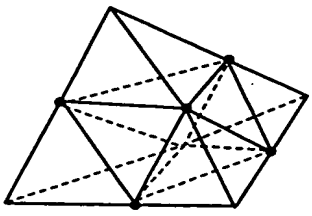
TEMPLATE FOR SPLITTING A TET ON

6 EDGES





THE RESULTING COMPACTED BODY IS:



ALL FACES HAVE THE FOLLOW SPLIT PATTERN

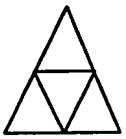


FIG. 17

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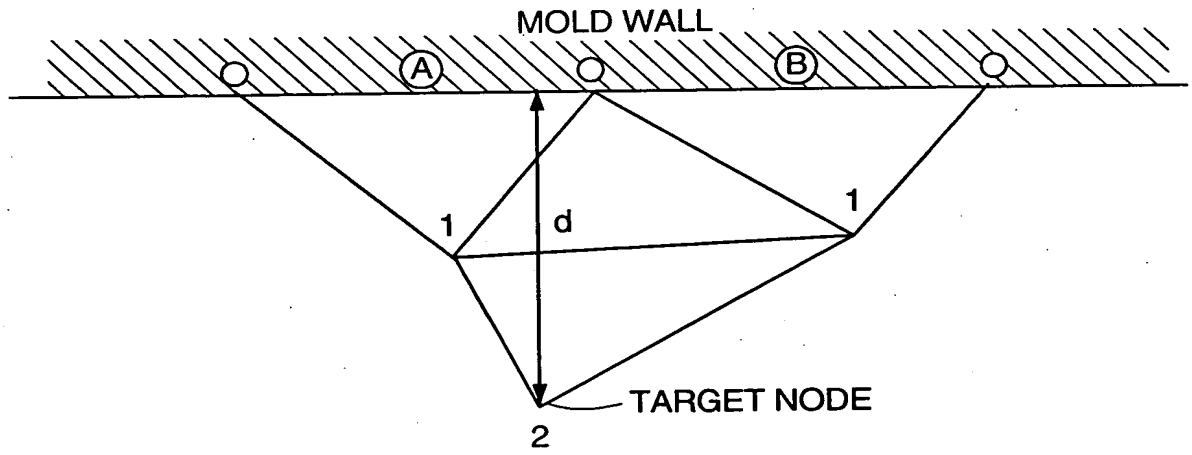

FIG. 18A

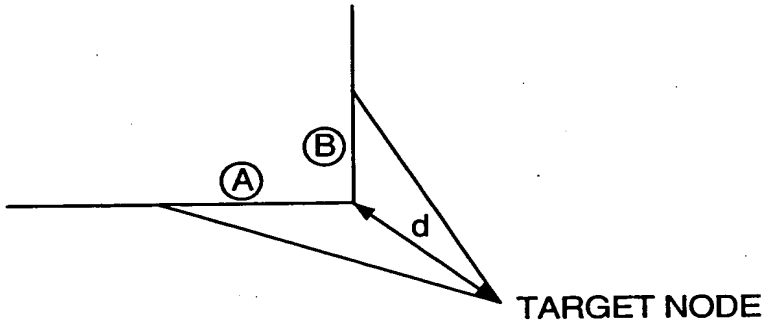

FIG. 18B

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Title: Method and Apparatus for Modeling Injection of a Fluid in a Mold Cavity
Inventors: Friedl et al.
Serial No.: 09/404,932
Atty Docket No.: MFL-001
Atty.: William R. Haulbrook, Ph.D.
Express Mail Mailing Label No.: EL 988705086 US
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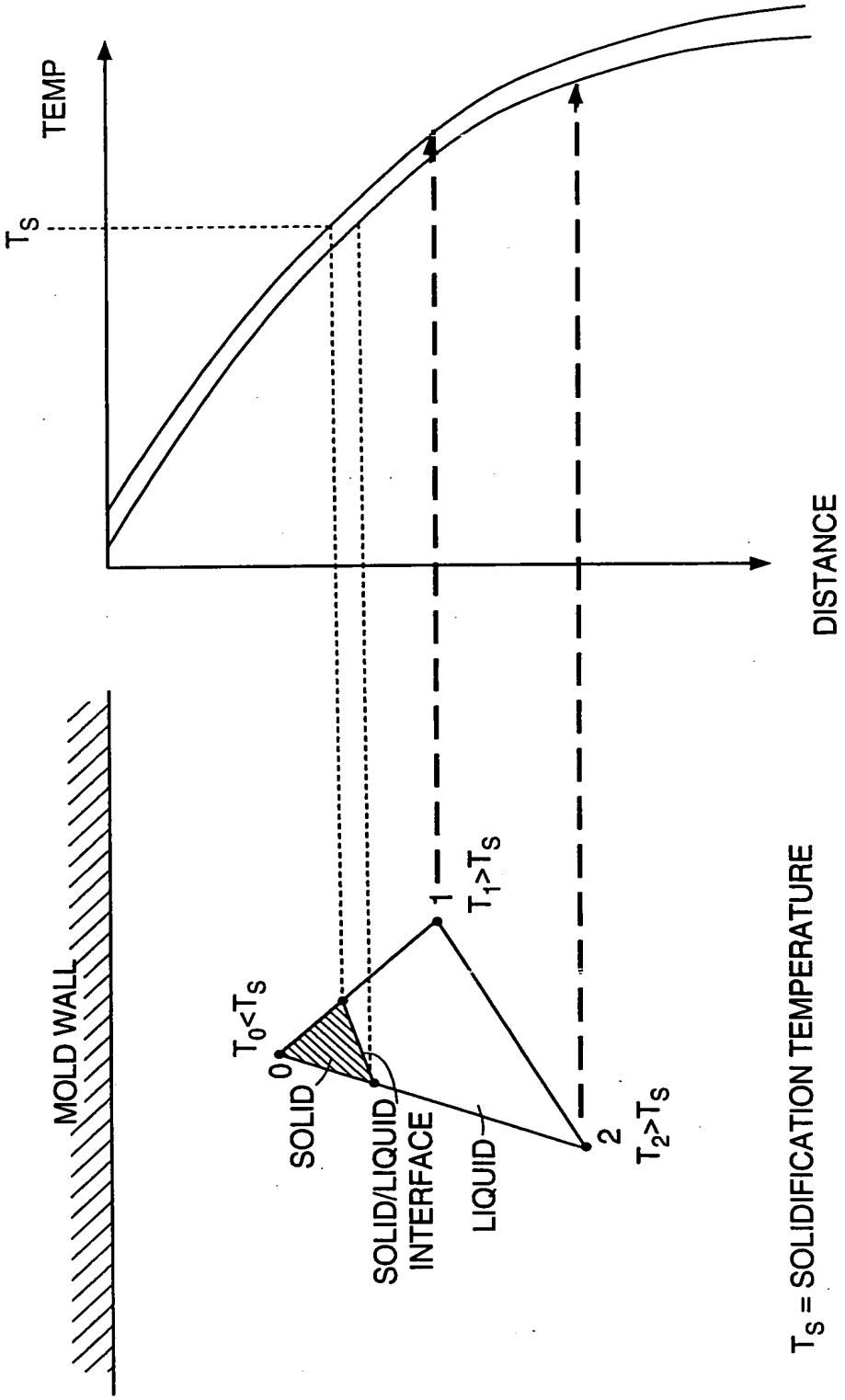

FIG. 19

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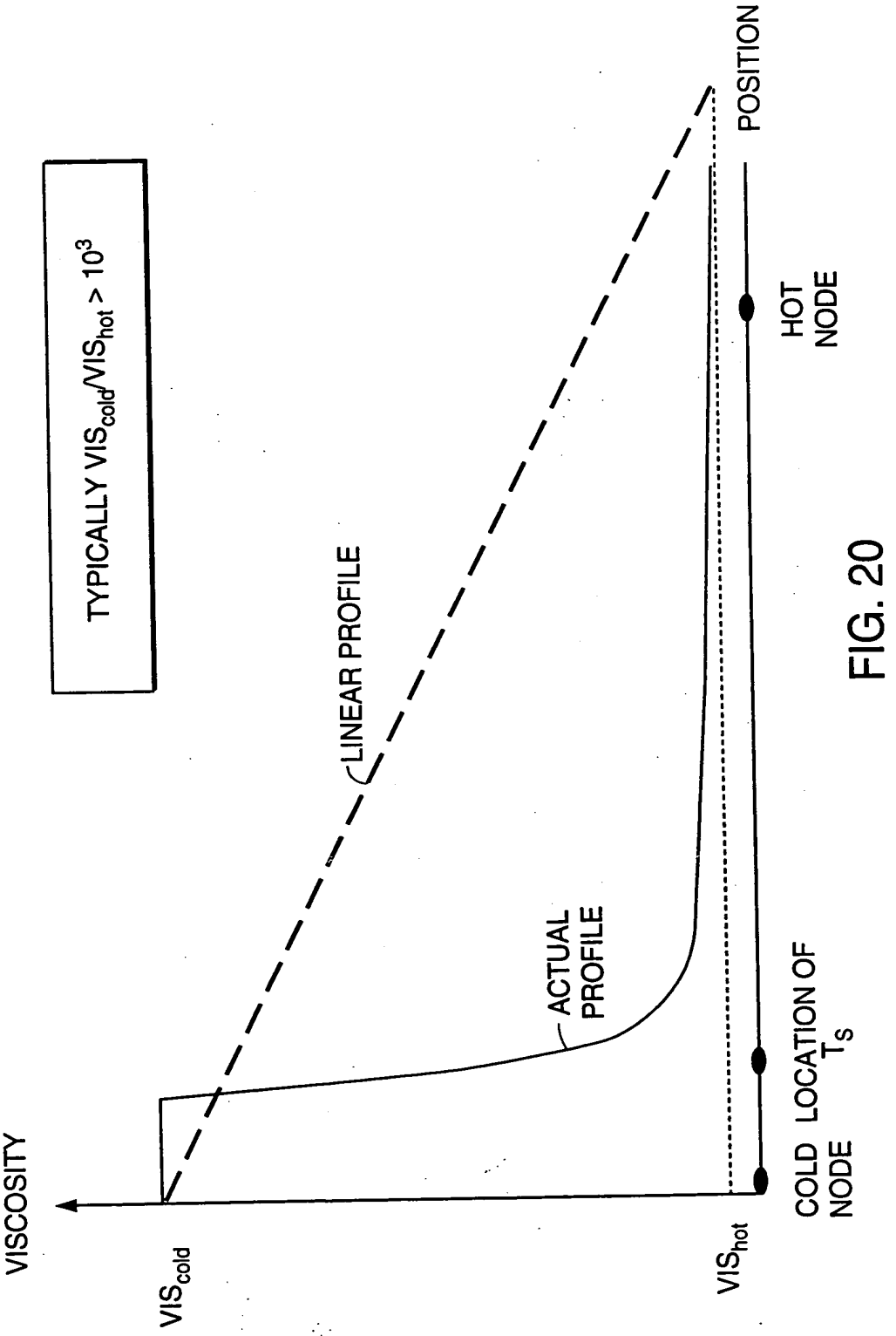

FIG. 20

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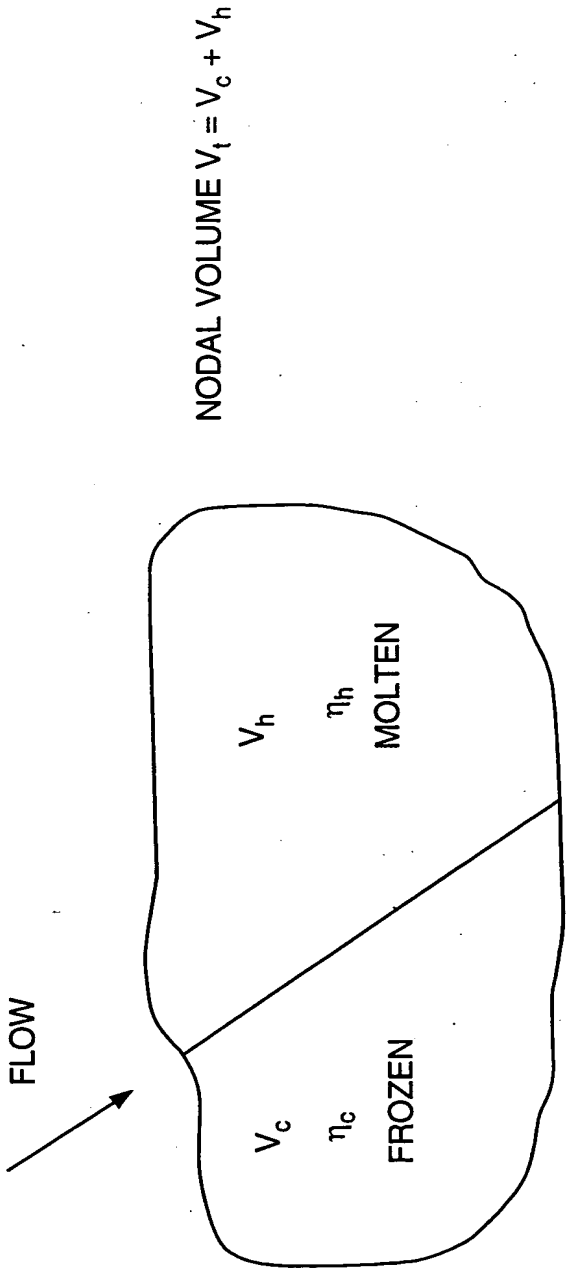

FIG. 21

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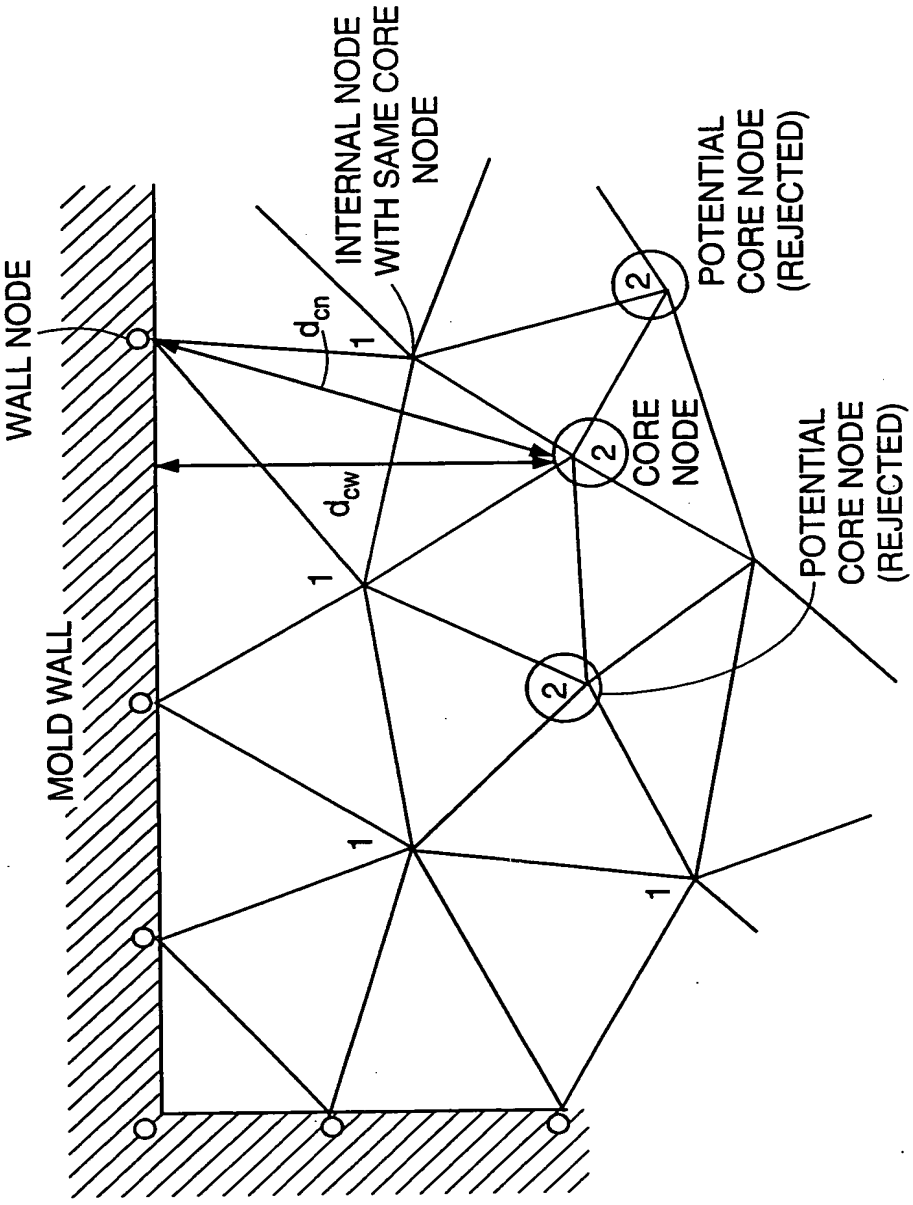

FIG. 22

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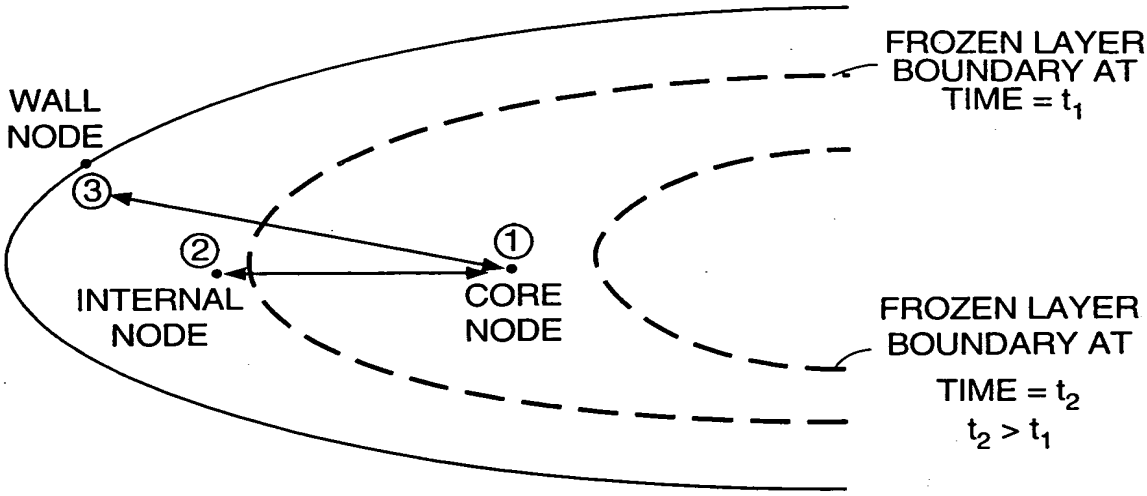

FIG. 23A

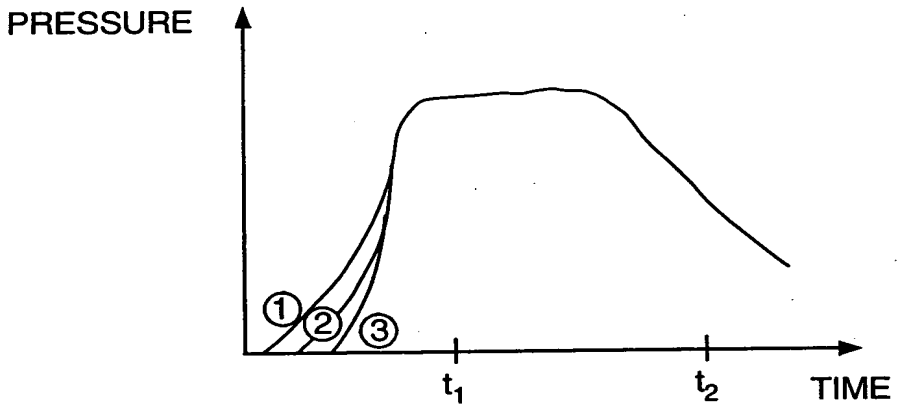

FIG. 23B

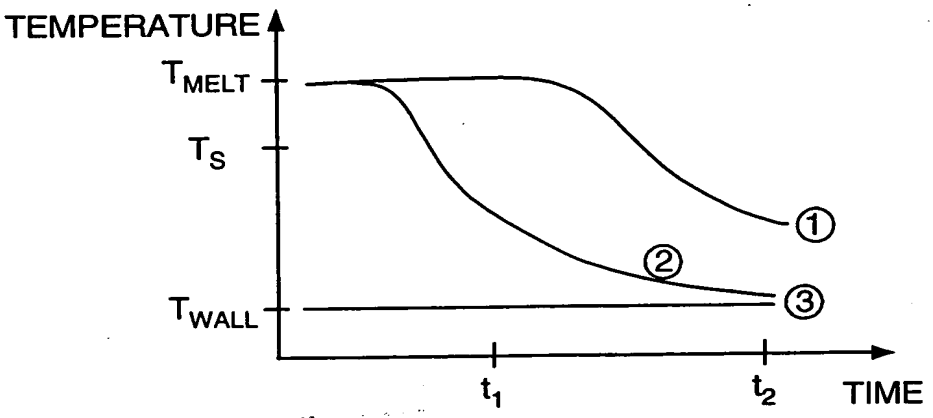

FIG. 23C

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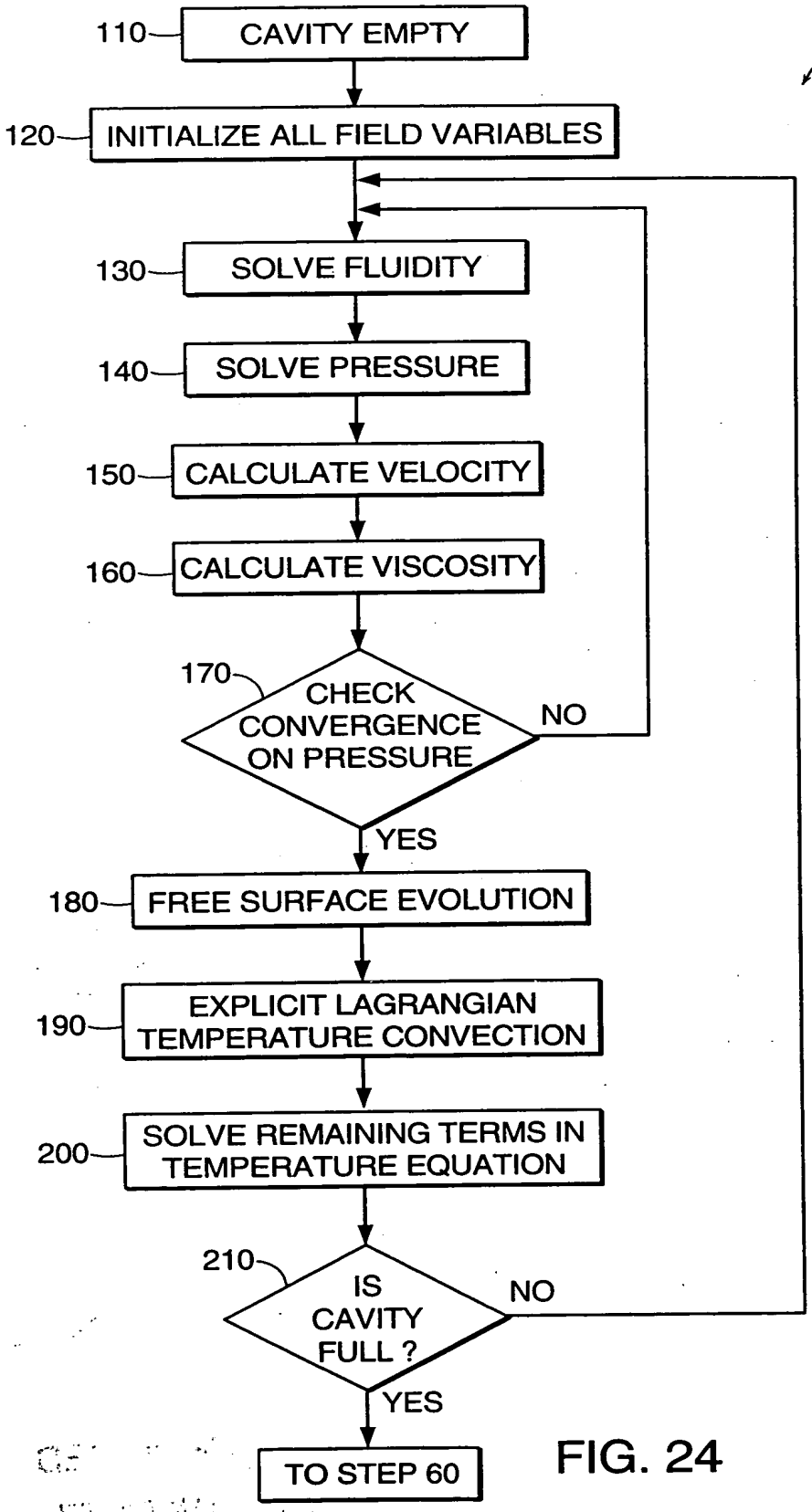

FIG. 24

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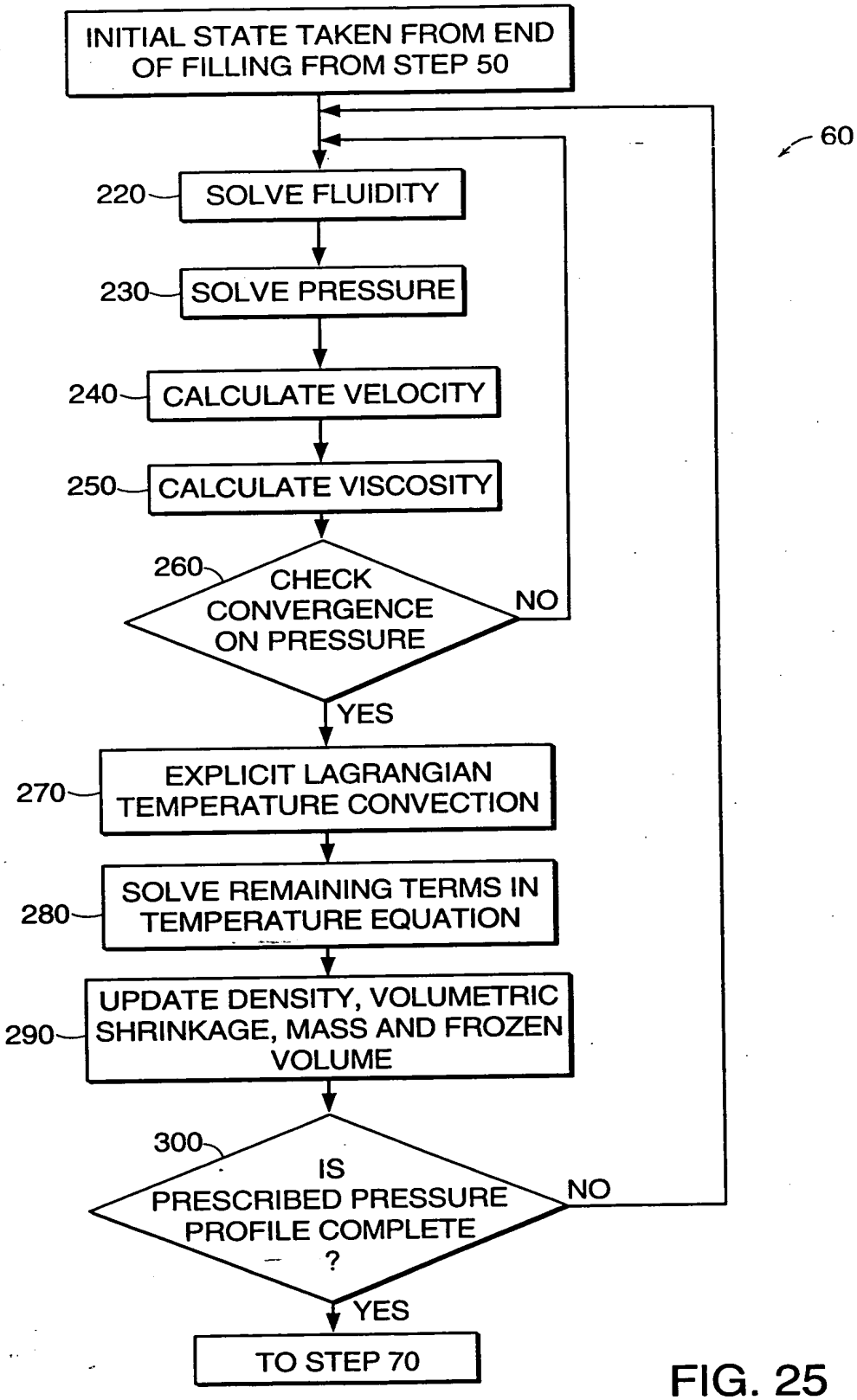

FIG. 25